Center Innovation Fund: AFRC CIF

Flexible Matrix Composites for Passive Flutter Suppression

Completed Technology Project (2016 - 2017)

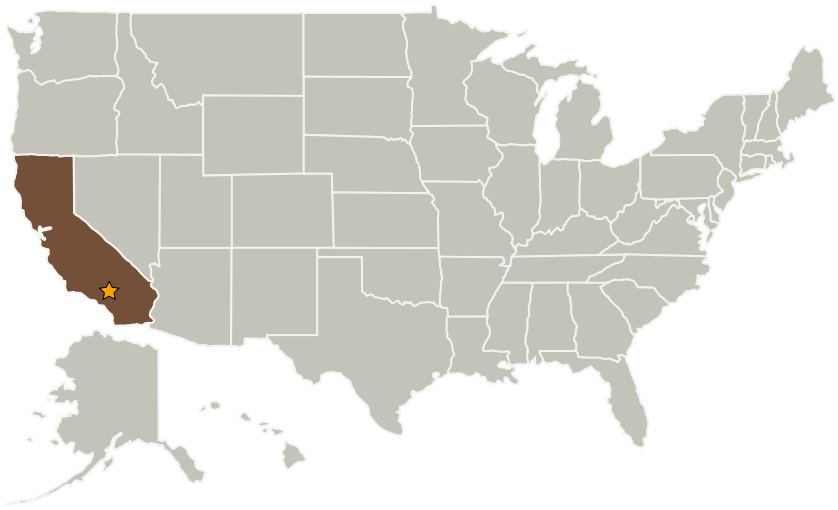
Project Introduction

Fabricate & test a small baseline non-tuned flutter model carried on F-15. Fabricate & test a small FMC tuned flutter model carried on F-15. ATW 1 and 2 were previously flown on the F-15. Demonstrate that tuned article flutter airspeed is 15% higher than non tuned.

Anticipated Benefits

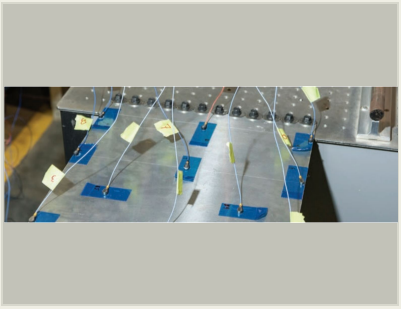
Future aircraft require both light weight and high aerodynamic efficiency. High aspect ratio and/or thin wings. Inherently flexible configurations. Flexible matrix composites (FMC) could provide sufficient suppression of flutter modes passively to enable these future aircraft FMC could alleviate need for active control of flutter modes while maintaining weight budgets

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California

Primary U.S. Work Locations
California



This CIF project allowed for the exploration of the FMC material for wing design applications. Researchers gained experience working with viscoelastic materials and determined that, while not currently appropriate for wing designs, FMC material...

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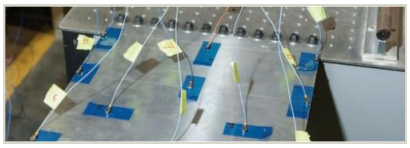
Images



Project Image
This CIF project allowed for the exploration of the FMC material for wing design applications. Researchers gained experience working with viscoelastic materials and determined that, while not currently appropriate for wing designs, FMC material may still provide value in other aerospace applications where temperature variation and stiffness losses are better tolerated. Collaboration with research partners formed a basis for future mutually beneficial research efforts.
(https://techport.nasa.gov/image/35773)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Center / Facility:
Armstrong Flight Research Center (AFRC)

Responsible Program:
Center Innovation Fund: AFRC CIF

Project Management

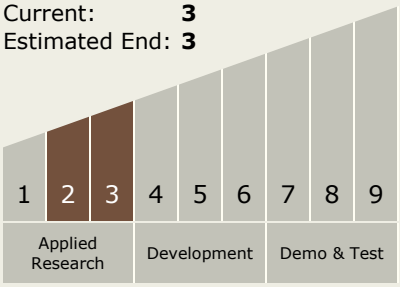
Program Director:
Michael R Lapointe

Program Manager:
David F Voracek

Principal Investigator:
Eric J Miller

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.3 Flexible Material Systems

Target Destination

Earth